Spot Safety Project Evaluation

Project Log # 200512220

Spot Safety Project # 09-97-210

Spot Safety Project Evaluation of the Installation of a Left Turn Lane on NC 66 (Old Hollow Rd) at SR 2024 (Old Valley School Rd) Forsyth County

Documents Prepared By:

Safety Evaluation Group
Traffic Safety Systems Management Section
Traffic Engineering and Safety Systems Branch
North Carolina Department of Transportation

Principal Investigator

_____ 06/23/2006
Brad Robinson, EI Date

Traffic Safety Project Engineer

Spot Safety Project Evaluation Documentation

Subject Location

Evaluation of Spot Safety Project Number 09-97-210 – NC 66 (Old Hollow Rd) at SR 2024 (Old Valley School Rd) in Forsyth County.

Project Information and Background from the Project File Folder

The spot safety project improvement countermeasure chosen for the subject location was the installation of a left turn lane on the north approach of NC 66 (Old Hollow Rd) at SR 2024 (Old Valley School Rd). NC 66 is a two-lane facility at the subject location with a speed limit of 45 mph.

The initial statement of problem was that accidents and congestion were due to a high volume of through traffic and left turning traffic from a single approach lane on NC 66 with a high volume of opposing traffic. The subject location is a three-leg intersection which is controlled by a stop sign on SR 2024 (Old Valley School Rd).

The initial crash analysis was conducted from July 1, 1994 to December 1, 1996, which included 18 crashes; 6 Rear-End crashes, 6 Left Turn-Same Roadway crashes, 2 Angle crashes, 3 Ran-Off-Roadway crashes, and 1 Sideswipe crash.

The final completion date for the improvement at the subject intersection was on November 13, 1998 with a total cost of $40,000.00.

Naive Before and After Analysis

After reviewing the spot safety project file folder along with all the crashes at the subject location, the crash data omitted from this analysis to consider for an adequate construction period was from September 1, 1998 through January 31, 1999. The before period consisted of reported crashes from November 1, 1991 through August 31, 1998 (6 years, 10 months) and the after period consisted of reported crashes from February 1, 1999 through November 30, 2005 (6 years, 10 months). The ending date for this analysis was determined by the available crash data at the time the crash analysis was completed.

The treatment data consisted of all crashes on a strip of NC 66 between 150 feet south of the turn lane taper (MP 11.86) to 150 feet north of the left turn lane and turn lane taper (MP 12.03). *Please see attached location map and photos for further details.*

The following data table depicts the Naive Before and After Analysis for the treatment location. Please note that Rear End Crashes on the north approach of NC 66 and Left Turn – Same Roadway Crashes involving southbound vehicles on NC 66 turning left onto SR 2024 were the target crashes for the applied countermeasure.

Treatment Information			
	Before	After	Percent Reduction (-) Percent Increase (+)
Total crashes	31	16	-48.4
Total Severity Index	7.03	7.59	8.0
Target Crashes	16	1	-93.8
Target Crashes Severity Index	8.98	8.4	-6.5
Volume	10,900	13,100	20.2

Injury Summary		
	Before	After
Fatal Injuries	0	1
Class A Injuries	3	0
Class B Injuries	2	4
Class C Injuries	27	4
Total Injuries	32	9

The naive before and after analysis at the treatment location resulted in a 48 percent decrease in Total Crashes, a 94 percent decrease in Target Crashes, and a 20 percent increase in Average Daily Traffic (ADT). The before period ADT year was 1995 and the after period ADT year was 2002.

Results and Discussion

The naive before and after analysis involving the comparison of treatment actual before data versus treatment actual after data resulted in a 48 percent decrease in Total Crashes and a 94 percent decrease in Target Crashes, while the ADT increased 20 percent. The total severity index increased eight percent while the target crash severity index decreased seven percent. The summary results above demonstrate that the treatment location appears to have had a decrease in both Total Crashes and Target Crashes from the before to the after period.

The increase in total crash severity can be misleading. There are almost 50 percent fewer crashes in the after period. One of the crashes was a fatality involving a driver running the stop sign at night. Another crash, which produced 2 "B" injuries, was a head-on crash involving a drunk driver running the stop sign and swerving to correct his mistake. Neither of these crashes were target crashes or appear to be caused by the turn lane installation.

Referencing the *Collision Diagrams*, there appears to be a problem with vehicles running the stop sign. There is a curve on SR 2024 just before the intersection that could restrict site distance to the stop condition. In the before period there were three (3) Ran-off-Roadway crashes and two (2) Angle crashes involving vehicles not stopping at the stop sign. In the after period there were three (3) Ran-Off-Roadway crashes, two (2) Angles crashes, and one (1) Head-On crash involving vehicles running the stop sign. These types of crashes were not target crashes for the

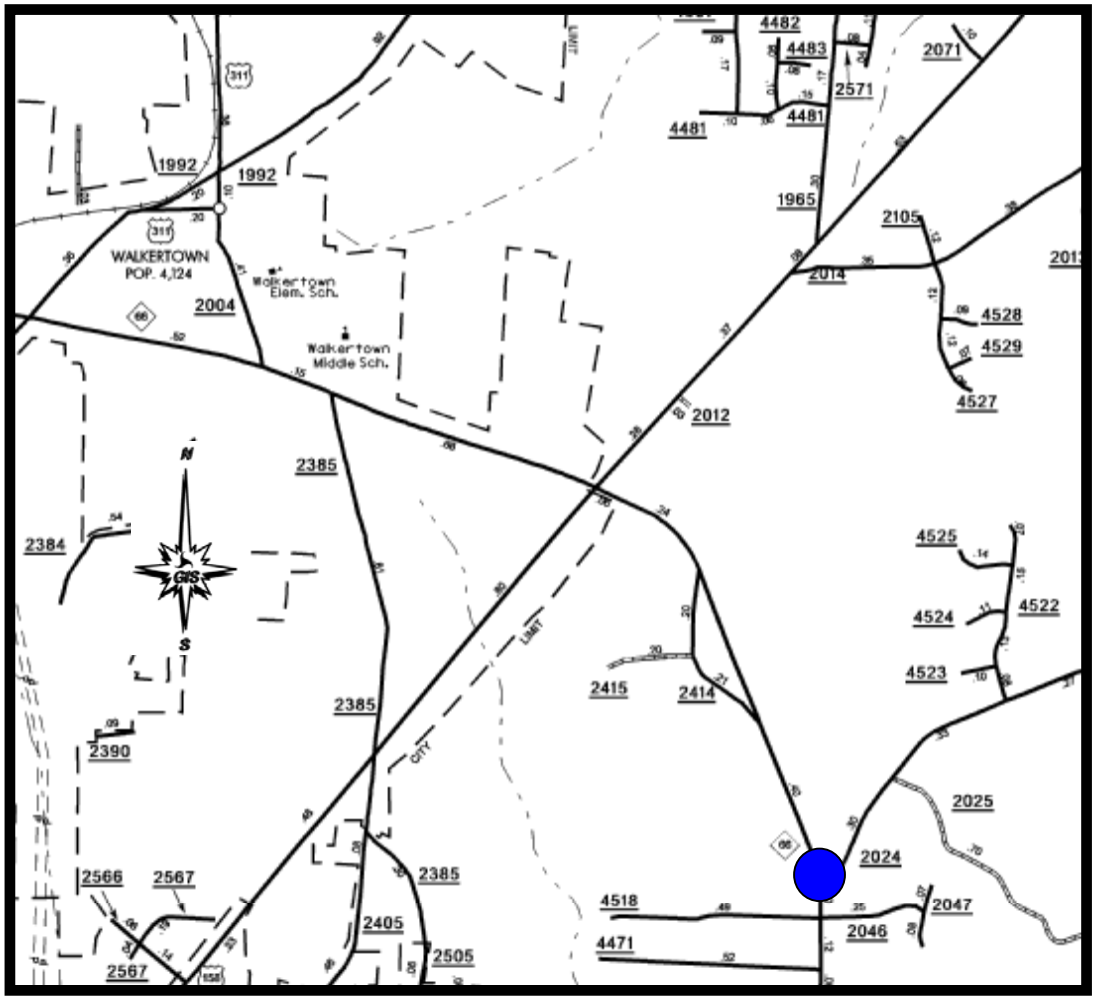
countermeasure. There are rumble strips, a "Stop Ahead" warning sign, and an over-sized stop sign now on SR 2024 to warn drivers of the stop condition.

Referencing the *Collision Diagrams* and the previous table, it is apparent that the installation of the left turn lane helped to decrease rear-end crashes and Left Turn-Same Roadway crashes involving southbound vehicles either turning or waiting to turn left onto SR 2024. In the before period there were 10 Rear-End and 6 Left Turn-Same Roadway crashes at the intersection. In the after period there were no Rear-End crashes and only one (1) Left Turn-Same Roadway crash at the intersection.

Please see the attached *Treatment Site Photos*. Photos are provided for all three approaches to the subject location.

As the Safety Evaluation Group completes additional spot safety reviews for this type of countermeasure, we will be able to provide objective and definite information regarding actual crash reduction factors for this type of intersection.

Location Map
Forsyth County
Evaluation of Spot Safety Project #09-97-210



Treatment Site Location: NC 66 (Old Hollow Rd) at SR 2024 (Old Valley School Rd)

TREATMENT SITE PHOTO TAKEN 5/4/2006

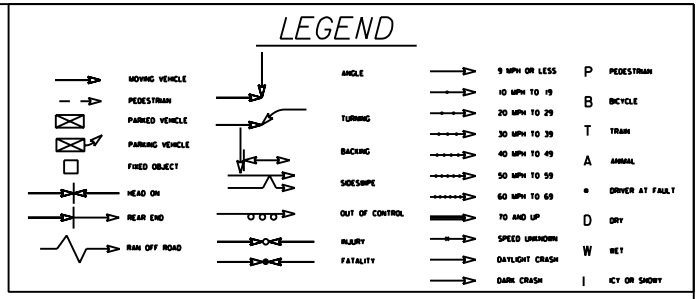
Traveling North on NC 66 (Old Hollow Rd)

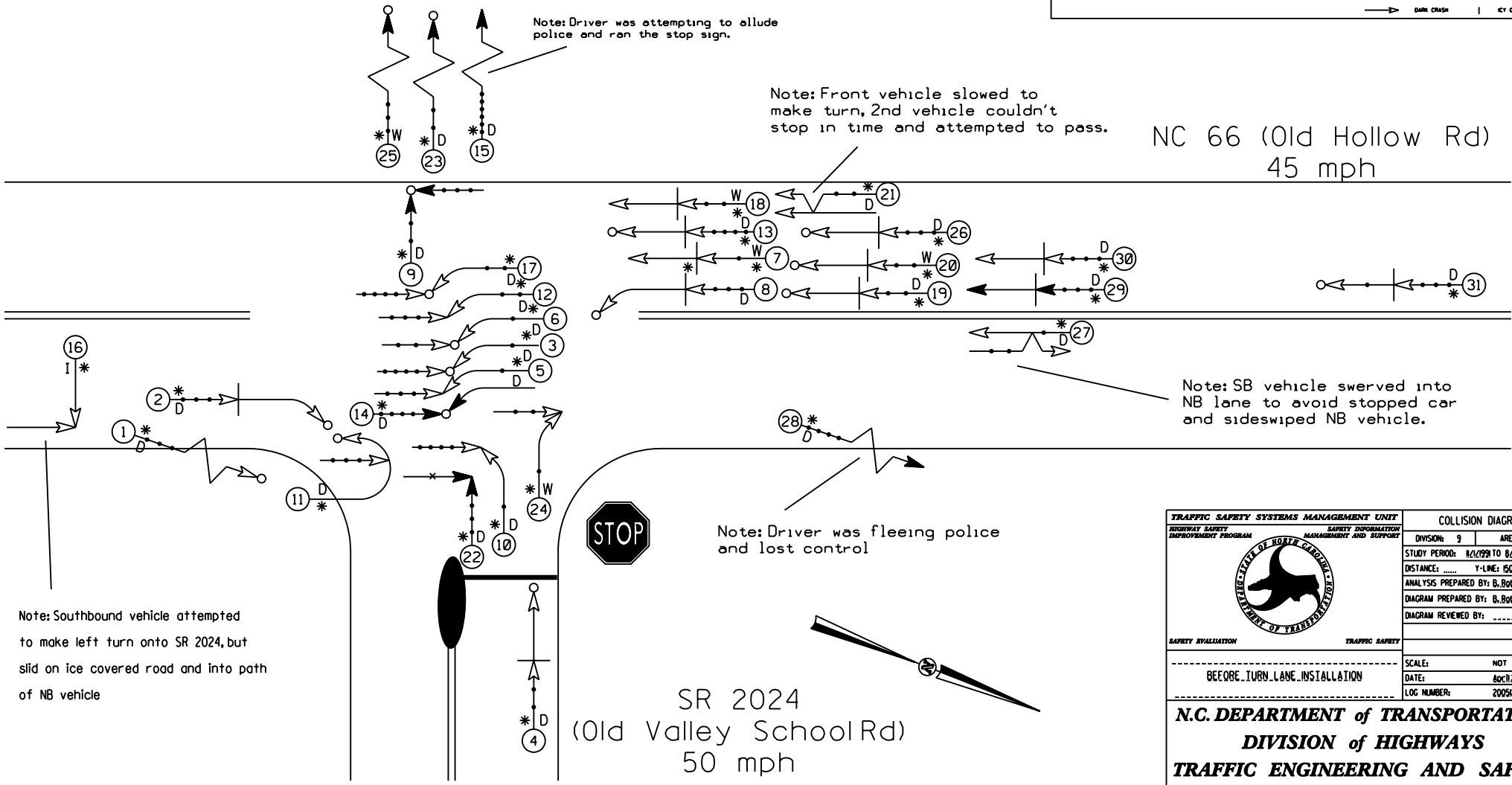
Traveling South on NC 66

Traveling South on NC 66 (Old Hollow Rd)

Traveling West on SR 2024 (Old Valley School Rd)

Forsyth County
NC 66 (Old Hollow Rd)
and SR 2024 (Old Valley School Rd)
Treatment Site in the Before Period
From 11/1/1991-8/31/1998



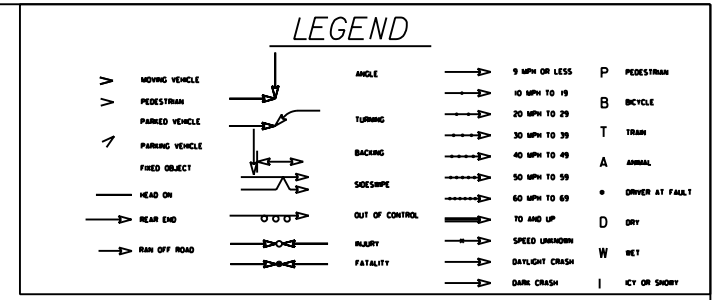


TRAFFIC SAFETY SYSTEMS MANAGEMENT UNIT	COLLISION DIAGRAM
HIGHWAY SAFETY IMPROVEMENT PROGRAM / SAFETY INFORMATION MANAGEMENT AND SUPPORT	DIVISION: 9 AREA: ..
	STUDY PERIOD: 11/1/1991 TO 8/31/1998
	DISTANCE: ..... Y-LINE: 150 FT
	ANALYSIS PREPARED BY: B.Robinson
	DIAGRAM PREPARED BY: B.Robinson
	DIAGRAM REVIEWED BY: _____
SAFETY EVALUATION / TRAFFIC SAFETY	
BEFORE TURN LANE INSTALLATION	SCALE: NOT TO SCALE
	DATE: 8oct2006
	LOG NUMBER: 20052220

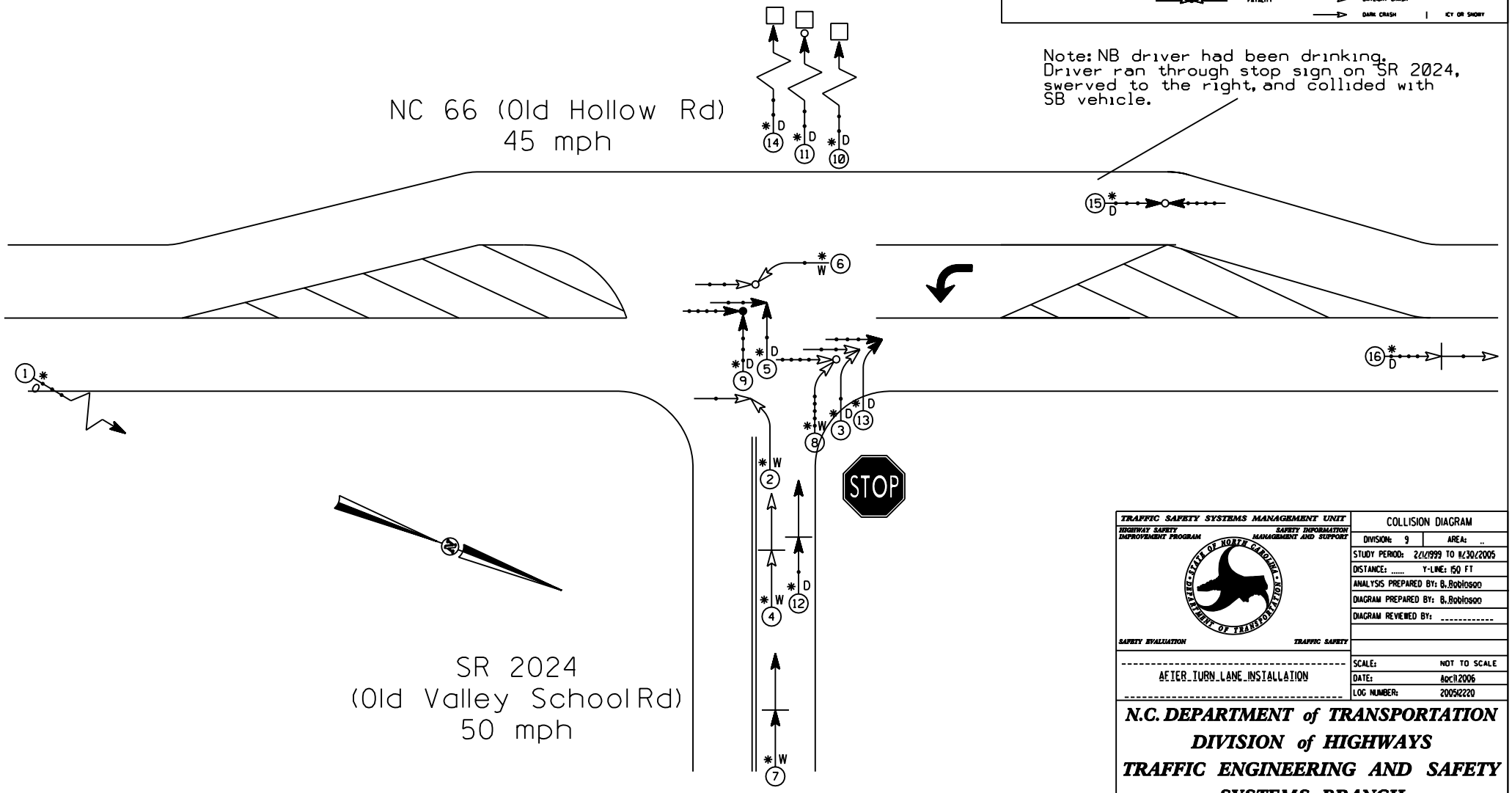
N.C. DEPARTMENT of TRANSPORTATION
DIVISION of HIGHWAYS
TRAFFIC ENGINEERING AND SAFETY SYSTEMS BRANCH

collisiondiagram.dgn 06/26/2006 04:52:55 PM

Forsyth County
NC 66 (Old Hollow Rd)
and SR 2024 (Old Valley School Rd)
Treatment Site in the After Period
From 2/1/1999-11/30/2005



Note: NB driver had been drinking. Driver ran through stop sign on SR 2024, swerved to the right, and collided with SB vehicle.



TRAFFIC SAFETY SYSTEMS MANAGEMENT UNIT	COLLISION DIAGRAM
HIGHWAY SAFETY IMPROVEMENT PROGRAM / SAFETY INFORMATION MANAGEMENT AND SUPPORT	DIVISION: 9 AREA: ..
	STUDY PERIOD: 2/1/1999 TO 11/30/2005
	DISTANCE: ..... Y-LINE: 150 FT
	ANALYSIS PREPARED BY: B.Robinson
	DIAGRAM PREPARED BY: B.Robinson
	DIAGRAM REVIEWED BY: ----------
SAFETY EVALUATION / TRAFFIC SAFETY	
AFTER TURN LANE INSTALLATION	SCALE: NOT TO SCALE
	DATE: April 2006
	LOG NUMBER: 20052220

N.C. DEPARTMENT of TRANSPORTATION
DIVISION of HIGHWAYS
TRAFFIC ENGINEERING AND SAFETY SYSTEMS BRANCH

collisiondiagram.dgn 06/26/2006 04:53:40 PM